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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,215	08/27/2003	Shahram Mostafazadeh	NSC1P275/P05654	7111

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EXAMINER

PAREKH, NITIN

ART UNIT PAPER NUMBER

2811

DATE MAILED: 08/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/650,215

Applicant(s)

MOSTAFAZADEH ET AL.

Examiner

Nitin Parekh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04-11-05 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3, 5, 6-9, 11 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Noma et al. (US Pat. Application Pub. 2003/0230805)

Regarding claims 1-3, 5 and 6, Noma et al. disclose a die-level image sensor/opto-electronic device (Fig. 1A) comprising:

- a semiconductor die (2/10a/4 in Fig. 1A) having edges (see exterior portion of 10a in Fig. 1A) and a charge coupled (CCD) circuit element/photonic device being electrically coupled to a wiring layer on first/top surface (see 5a in Fig. 1A; sections 0043 and 0044) and optically exposed to an ambient light through a transparent epoxy layer and an optically transparent glass substrate/laminate (4 and 3 respectively in Fig. 1A; sections 0063 and 0064)
- a conductive structure (9a/8 in Fig. 1A) formed in and through a portion of the die and away from/not on the side edges of the die extending horizontally

towards an interior portion of the die (see 9a/8 being extended interior of the side edge 10a and extending horizontally in Fig. 1A)

- the conductive structure being exposed on a second/bottom surface of the die that opposes the first surface (see Fig. 1A), wherein the conductive structure is electrically connected to the CCD/photonic device
- the conductive structure having an under bump metallization (UBM) pad/cushion (see 7 in Fig. 1A) attached to the second/bottom surface, the UBM pad/cushion being electrically connected to the conductive structure
- the conductive structure further comprising a solder ball/bump (see 8 in Fig. 1A; section 0073) extending beyond the second/bottom surface, and
- the optically transparent laminate attached to the first surface of the die so as to cover/overlay the CCD circuit element/photonic device

(Fig. 1A; Fig. 4-8B; sections 0040-0049; 0062-0073).

Regarding claims 7-9, 11 and 12, Noma discloses the entire claimed structure as applied to claims 1-3, 5 and 6, above, wherein Noma teaches a plurality of CCD circuit element/photonic devices/dice being formed on a wafer/substrate (see Fig. 1A and 4; sections 0040-0049; 0062-0073).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noma et al. (US Pat. Application Pub. 2003/0230805) in view of Chungpaiboonpatana et al. (US Pat. Application Pub. 2003/0193078)

Regarding claims 4 and 10, Noma teaches substantially the entire claimed structure as applied to claims 1, 3, 7 and 9 above, except the UBM pad being redistributed so as to occupy a different location on the second surface than the conductive structure.

Chungpaiboonpatana et al. teach a metallization on a surface of a die (see 100 in Fig. 1) where the metallization pattern includes a conventional redistribution structure having conductive solder ball/UBM pad being redistributed and connected to other pads so as to occupy a different location on the surface (see 106 and 102 respectively in Fig. 1) to provide improved grounding, electrical performance and reduced signal noise/degradation (Col. 1-3).

It would have been obvious to a person of ordinary skill in the art at the time invention was made to incorporate the UBM pad being redistributed so as to occupy a

different location on the second surface than the conductive structure as taught by Chungpaiboonpatana et al. so that the electrical performance, grounding and repair/rework capability can be improved in Noma's opto-electronic device.

Response to Arguments

4. Applicant's arguments filed on 04-11-05 have been fully considered but they are not persuasive.

A. Applicant contends that Noma discloses the conductive structure being on the side edge of the die and not away from the side edges of the die.

However, as explained above, the conductive structure (9a/8 in Fig. 1A) is not formed directly on the side edges (see side edges 10a in Fig. 1A), but formed in and through a portion of the die and away from/not on the side edges of the die extending horizontally towards an interior portion of the die.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nitin Parekh whose telephone number is 571-272-1663. The examiner can normally be reached on 09:00AM-05:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9318.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAN or Public PAG. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAG system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). Any inquiry of a general nature or relating to the

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status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

NP

06-16-05



NITIN PAREKH

PRIMARY EXAMINER

TECHNOLOGY CENTER 2800